Space Weather Forecast

Issued on Thursday, 16 February 2023 at 01:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Moderate class flares (R1/R2 Radio Blackouts) likely, with a slight chance of isolated Strong class flares (R3 Radio Blackout). CME arrival forecast on 17 February, G1/Minor Storms likely with a chance of G2/Moderate Storms.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been at Moderate levels, with four Moderate-class flares observed from a region which has recently rotated across the western horizon of the solar disc. A further region close to the limb also presents a risk of moderate and strong flares, with this risk continuing for a few days after the region rotates from view. The most notable region on main portion of the disc is in the north-centre disc and has a highly complex classification, indicating a heightened potential for flare activity. The remaining regions on the visible disc are all considered to be simple and benign.

A CME (coronal mass ejection) which originated from a region in the southeast quadrant has been analysed and is forecast to arrive at Earth later on 17 February.

Solar Wind / Geomagnetic Activity: The Earth is currently being affected by a CME. The speed has been relatively consistent at background levels but the total magnetic field strength has progressively increased from weak to strong levels through a series of jumps as the Earth moved into the main body of the CME. The north-south component was moderately negative, but became strongly positive late in the period. Geomagnetic activity has been Unsettled to Active, with one G1/Minor Storm period early in the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is forecast to be mainly Moderate, with a very slight chance of High activity due to X-class flares.

Solar Wind / Geomagnetic Activity: Earth is currently under the influence of a CME, with the effects of this likely to wane through 16 February. A further CME which left the Sun on 15 February is forecast to arrive at Earth later on 17 February. Effects from this CME are then likely to last at least through much of 18 February and possibly into 19 February. No fast solar winds are forecast, although the CME arrival could lead to slightly elevated winds. Geomagnetic activity is expected to decline to mainly Quiet to Unsettled levels on 16 February. G1/Minor storm periods and a risk of G2/Moderate storms are then possible in 17 February due to the CME arrival, with a reducing risk of geomagnetic storms as the forecast period progresses.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office Space Weather Forecast

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background levels, but there is a slight chance of exceeding the S1/Minor radiation storm level in response to any significant flares that occur.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	5	60	30	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.